

## **7.0 DATA MANAGEMENT AND REPORTING**

Given the expected 30-year time frame of BEMP implementation, the variety of data to be collected, and the anticipated synthesis of BEMP data with remedial action effectiveness monitoring data, it is critical that the data generated under the BEMP be disseminated to interested parties on a routine basis and archived in a standardized, high-quality format. The routine release of data reports and convenient access to available data will allow interested stakeholders to review and assess the data in support of Basin environmental decision processes. The BEMP data will be reported, managed, and made available electronically by several mechanisms:

- The STORET web-based data management system
- Annual data summary reports
- Five-year data analysis and assessment reports

The following sections discuss the web-based data management system for the BEMP and the scopes of annual and five-year reports.

### **7.1 DATA MANAGEMENT**

Data collected under the BEMP will be managed in a centralized database repository with a web-based portal for accessing and updating Basin environmental data. As the BEMP data will represent the institutional memory of many diverse users and data sets collected over many years, a non-proprietary software solution has been selected so that the project team is not locked into technologies or procedures accessible to only a select few. In addition, an "enterprise-level" database system is required to manage the data due to the large volume of historic and future project data and the anticipated large number of concurrent users. The EPA STORage and RETrieval (STORET) data base application has been identified as the BEMP data management system.

The STORET server model is a distributed database application that runs on the Oracle platform. STORET is a repository for water quality, biological, and physical data and is currently used by state environmental agencies, EPA and other federal agencies, universities, private citizens, and others. STORET is a national EPA standard that has been in use since the 1970s, which has evolved to the current Version 2.0 (modernized STORET) of the data structure. The publicly accessible STORET website includes open-source code for the database, free data management applications, a widespread user community, and technical support from EPA into the foreseeable future. Since EPA has adapted STORET as the national environmental database, there is additional technical support and financial resources from EPA Headquarters and other EPA Regions which enhance the practicality and affordability of STORET for the Coeur d'Alene

Basin project. STORET satisfies the primary data management requirements for BEMP monitoring data and has room for growth.

The data management system includes open-source STORET tools such as the STORET Interface Module (SIM) data loader and web-based geographical information system (GIS) mapping applications developed by EPA Region 10 technical staff. These applications are integrated into a web-based project team portal hosted in EPA Region 10 and accessible to all project team members (Figure 7-1). The SIM tool will be implemented on the web so that agencies collecting BEMP data can directly upload their data to the repository and take ownership of their data management efforts. Data extractions/query tools and spatial data (basin maps) viewing capabilities will be incorporated into the portal so that data users and providers can access public data online shortly after it has undergone QA and been loaded to the STORET repository. Existing and historical GIS maps and environmental data already produced as part of the RI/FS will be incorporated into the portal, so that useful information is available as soon as the portal is brought online for public access.

The key underpinning of the BEMP data management system is a standardized electronic data deliverable (EDD) specification that defines the types of data and submission formats required for the STORET repository. The BEMP EDD is the predominant method by which data is exchanged and uploaded to a centralized repository for the Coeur d'Alene Basin and will be reviewed and modified in conjunction with the implementation of the BEMP. This EDD incorporates sampling and analytical SOPs and has been developed with supporting documentation that can be easily updated, as necessary, to address revised data management requirements identified over the time frame of BEMP monitoring activities.

The customized BEMP EDD format has been developed collaboratively with Coeur d'Alene stakeholders to address anticipated project team data requirements including location/station data, sampling events, analytical results, biological surveys, and field measurements. The EDD contains detailed specifications for data types (date, number, alphanumeric), field sizes and precision, required data elements and content, and format required for upload to the STORET repository via the SIM data loader. Agencies performing BEMP monitoring will be responsible for providing data to EPA in the BEMP EDD format for uploading to STORET by EPA or their contractor. It is anticipated that entities conducting the monitoring will eventually be able to load the monitoring data to STORET independently.

## **7.2 REPORTING**

In addition to continually updated data available via STORET, data collected under the BEMP will be summarized annually. Data reports released annually will be limited-scope annual "data transmittals" with minimal data analyses. Every five years, more comprehensive, five-year reports summarizing the current understanding of environmental status and trends in the Basin as pertinent to the CERCLA-required five-year process.

### **7.2.1 Annual Data Summary Reports**

Data collected under the BEMP will be summarized and reported annually. The annual data summary reports will include tables and figures showing the monitoring data, including updated time histories. Analysis in the yearly reports will be limited to computation of standard sample statistics. Interpretation and evaluation in the annual reports will be limited to identification of any potentially significant “anomalies” or concerns that may require early attention, before consideration in the more comprehensive 5-year reports. Limited-scope, annual data summary reports will be available on the EPA and Basin Commission websites. Annual summary reports will be completed by the end of January of the following year. This reporting schedule will allow for the incorporation of the previous field season’s sampling and monitoring activities and the October baseflow surface water sampling event. In the event that analytical results have not been received and/or reviewed by the end of a calendar year, the annual summary report will identify what sampling was performed and the expected time frame for receipt of analytical results.

### **7.2.2 Five-year Data Analysis and Assessment Reports**

The BEMP assumes that extensive analysis of accumulated monitoring data will be conducted at five-year intervals timed to support the 5-year remedy reviews required by CERCLA (Section 1.6). These five-year data analyses will follow the approach discussed in Section 6.1 and also include the assessment of results discussed in Section 6.2. In addition to data collected under the BEMP, the five-year data analyses may incorporate data collected as part of remedial action-specific monitoring or other monitoring programs in the Basin (i.e. Lake Environmental Monitoring Plan data). The five-year analyses and assessments will be documented in BEMP Technical Memoranda, which will be used to support the five-year remedy reviews. The BEMP Technical Memoranda will be completed by the end of February to allow for review by EPA and incorporation into the five-year review preparation activities.

The ROD calls for an adaptive management framework for remedy implementation. The environmental monitoring under the BEMP is anticipated to evolve over the 30-year interim remedy implementation time frame. The BEMP is expected to evolve to reflect a better understanding of Basin processes, changes in monitoring tools and techniques. The five-year data analysis and assessment reports will be a key component of the adaptive management review of the progress made under the OU-3 ROD. Specific components include detecting trends or major trend discontinuities, which may signal a need to update critical assumptions or change management practices or the BEMP itself. These evaluations and the experience gained from remedy implementation may help identify and guide “course corrections” that improve remedy performance or cost-effectiveness.

